Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method of transmitting a signal having a sequence of symbols through at least one channel with intersymbol interference, comprising the steps of:

dividing the sequence of symbols to form a plurality of symbol streams; and

processing the plurality of symbol streams before transmitting each symbol stream through a channel, wherein processing the plurality of symbol streams comprises time-reversing at least one of the symbol streams before transmitting the at least one of the processed symbol streams.

2. (Previously Presented) A method of transmitting a signal of the type comprising a sequence of symbols over spaced antennas, or antennas of different polarization, to reduce fading and intersymbol interference, comprising the steps of:

dividing a transmission frame into first and second blocks;

processing the sequence of symbols to generate first, second, third, and fourth symbol sequences so that some of the symbols in at least one of the symbol sequences are time-reversed, some of the symbols in at least one of the symbol sequences are complex conjugated, and some of the symbols in at least one of the symbol sequences are negated, the third symbol sequence corresponding to the first symbol sequence and the fourth symbol sequence corresponding to the second symbol sequence, and;

during the first block of the transmission frame, applying the first symbol sequence to a first antenna and the second symbol sequence to a second antenna and during the second block of the transmission frame applying the fourth symbol sequence to the first antenna and the third symbol sequence to the second antenna.

3. (Previously Presented) The method of claim 2 wherein processing the sequence of symbols comprises dividing the sequence of symbols to obtain the first and the second symbol sequences, processing the first symbol sequence to obtain the third symbol sequence, and processing the second symbol sequence to obtain the fourth symbol sequence.

4. (Previously Presented) A transmitter for transmitting signals of the type comprising a sequence of symbols over spaced antennas, or antennas of different polarization, to reduce fading while handling intersymbol interference efficiently, comprising:

a processor for processing the sequence of symbols to generate first, second, third, and fourth symbol sequences so that some of the symbols in at least one of the symbol sequences are time-reversed, some of the symbols in at least one of the symbol sequences are complex conjugated, some of the symbols in at least one of the symbol sequences are negated, the third sequence corresponding to the first sequence and the fourth sequence corresponding to the second sequence, and;

means for applying during a first block of a transmission frame the first symbol sequence to a first antenna and the second symbol sequence to a second antenna and during a second block in the transmission frame the fourth symbol sequence to the first antenna and the third symbol sequence to the first antenna.

5. (Previously Presented) The method of claim 3 wherein:

processing the second symbol sequence comprises time reversing, complex conjugating and negating the second symbol sequence to generate the fourth symbol sequence; and

processing the first symbol sequence comprises time reversing and complex conjugating the first symbol sequence to generate the third symbol sequence.

6. (Previously Presented) The method of claim 3 wherein the step of dividing the sequence of symbols further comprises the step of assigning symbols to the first symbol sequence and the second symbol sequence such that there is an equal amount of symbols in each

of the first and second symbol sequences and that correlation between symbols close to each other in each of the first and second symbol sequences is not significantly effected .

7. (Previously Presented) The method of claim 6 wherein the step of dividing the sequence of symbols further comprises the step of assigning at least one training symbol, which is a non-data part of the signal, to each of the first and the second symbol sequences.

8. (Previously Presented) The method of claim 7 wherein the step of assigning at least one training symbol to each of the first and the second symbol sequences further comprises the step of assigning a number of training symbols equal to an anticipated delay spread to each of a beginning and an end of each of the first and the second symbol sequences.

9. (Previously Presented) The method of claim 5 wherein the first and second antennas are replaced by respectively ones of a first and a second groups of antennas, each group comprising a plurality of antennas that are spaced from each other, or differently polarized with respect to each other, wherein the step of applying the first symbol sequence to the first antenna and the second symbol sequence to the second antenna during the first transmission block is replaced by the step of transmitting the first symbol sequence from the first group of antennas during the first transmission block using a delay diversity technique and transmitting the second symbol sequence from the second group of antennas during the first transmission block using a delay diversity technique; and

wherein the step of applying the fourth symbol sequence to the first antenna during the second transmission block and applying the third symbol sequence to the second antenna is replaced by the step of transmitting from the first group of antennas using a delay diversity technique during the second transmission block the fourth symbol sequence, and transmitting from the second group of antennas using a delay diversity technique the third symbol sequence.

10. (Previously Presented) The method of claim 9 wherein the first and the second groups of antennas are spaced away from each other or have different polarizations with respect to each other.

11. (Currently Amended) A method for receiving and processing signals transmitted from a transmitter to a receiver, comprising the steps of:

receiving a first symbol stream in a first block of a frame;

receiving a second symbol stream in a second block of the frame;

time reversing and taking the complex conjugate~~ing~~ form of the second symbol stream in the second block ~~second symbol streams to form a third symbol stream~~; and

filtering the first symbol stream in the first block ~~first symbol stream~~ and the time reversed and complex conjugate form of the second symbol stream ~~third symbol stream~~ to form decoupled outputs.

12. (Currently Amended) The method of claim 11 wherein the first and second symbol streams each comprises first and second portions, the first portion of the first symbol stream depending on a first ~~pre-transmission~~ symbol sequence $d_1(t)$ and a second portion of the first symbol stream depending on a second ~~pre-transmission~~ symbol sequence $d_2(t)$, the first portion of the second symbol stream depending on $d_2(t)$, the second portion of the second symbol stream depending on $d_1(t)$, and the step of filtering further comprises filtering the first symbol stream and the time reversed complex conjugate of the second symbol stream in the second block ~~third symbol streams~~ using a matched filter according to

$$\begin{bmatrix} z_1(t) \\ z_2(t) \end{bmatrix} = \begin{bmatrix} h_1^*(q) & h_2(q^{-1}) \\ h_2^*(q) & -h_1(q^{-1}) \end{bmatrix} \begin{bmatrix} r_1(t) \\ r_2(t) \end{bmatrix}$$

wherein $r_1(t)$ is the first symbol stream and $r_2(t)$ is the time reversed complex conjugate of the second symbol stream ~~are the first and third symbol streams, respectively~~, $z_1(t)$ and $z_2(t)$ are the decoupled outputs, $h_1(q^{-1})$ is a polynomial in a unit delay operator q^{-1}, describing a first

channel from which the first portion of the first symbol stream is received, $h_2(q^{-1})$ is a polynomial in the unit delay operator q^{-1}, describing a second channel from which the second portion of the first symbol stream is received, $h_1^*(q)$ and $h_2^*(q)$ are polynomials in a unit advance operator q representing effective channels from which the first and second portions of the second symbol stream are received, respectively, outputs $z_1(t)$ and $z_2(t)$ being decoupled in that $z_1(t)$ depends on the first ~~pre-transmission~~ symbol stream $d_1(t)$ and not on the second ~~pre-transmission~~ symbol stream $d_2(t)$, and $z_2(t)$ depends on the second ~~pre-transmission~~ symbol stream $d_2(t)$ and not on the first ~~pre-transmission~~ symbol stream $d_1(t)$.

13. (Previously Presented) The method of claim 11 further comprising the step of:

after the step of filtering, estimating the symbol stream $d_1(t)$ from output $z_1(t)$ and symbol stream $d_2(t)$ from output $z_2(t)$.

14. (Previously Presented) The method of claim 11 where each of the first and second symbol streams is received by multiple antennas and is combined in order to increase signal quality and reduce interference.

15. (Previously Presented) A system for transmitting data while reducing the effects of fading and handling intersymbol interference efficiently comprising:

a first antenna and a second antenna; and

an encoder coupled to the first and second antennas and adapted to divide a signal into a first and a second symbol stream, each symbol stream having a plurality of symbols, the encoder adapted to transmit the first symbol stream through the first antenna during a first block of a transmission frame, to transmit the second symbol stream through the second antenna during the first block of the transmission frame, to transmit through the second antenna a time reversed and complex conjugate form of the first symbol stream during a second block of the transmission

frame, and to transmit through the first antenna a time reversed, complex conjugate and negated form of the second symbol stream during the second block of the transmission frame.

16. (Previously Presented) The system of claim 15 wherein each symbol has a symbol value and the encoder is further adapted to assign the symbols to each of the first symbol stream and the second symbol stream such that there is an equal amount of symbols in each of the first and second symbol streams .

17. (Previously Presented) The system of claim 15 wherein the encoder is further adapted to assign at least one training symbol, which is a non-data part of the signal, to each of the first and second symbol streams.

18. (Previously Presented) The system of claim 15 wherein the encoder is further adapted to assign a number of training symbols, which is a non-data part of the signal, equal to a delay spread to each of a beginning and an end of each of the first and the second symbol streams.

19. (Previously Presented) A system for transmitting data while reducing the effects of fading and handling intersymbol interference effectively comprising:

a first antenna group and a second antenna group, each group comprising a plurality of antennas; and

an encoder coupled to the first and second antenna groups and adapted to divide a signal into a first and a second symbol streams, each symbol stream having a plurality of symbols, the encoder adapted to transmit the first symbol stream through the first antenna group using a delay diversity technique during a first block of a frame, to transmit the second symbol stream through the second antenna group using a delay diversity technique during the first block of the frame, to transmit through the second antenna group a time reversed and complex conjugate form of the first symbol stream during a second block of the frame, and to transmit through the first antenna

group a time reversed, complex conjugate and negated form of the second symbol stream during the second block of the frame.

20. (original) The system in claim 19 wherein the antennas within each group are spaced apart from one another.

21. (cancelled)

22. (Previously Presented) The system in claim 20 further comprises:

a first and a second antenna within the first antenna group; and

the encoder is further adapted to use a delay diversity technique wherein the first symbol stream is transmitted from the first antenna and after a delay period the first symbol stream is transmitted from the second antenna.

23. (Previously Presented) The system of claim 19 wherein each symbol has a symbol value and the encoder is further adapted to assign the symbols to each of the first symbol stream and the second symbol stream such that there is an equal amount of symbols in each of the first and second symbol streams .

24. (Original) The system of claim 23 wherein the encoder is further adapted to assign at least one training symbol, which is a non-data part of the signal, to each of the first and second symbol streams.

25. (Previously Presented) The system of claim 24 wherein the encoder is further adapted to assign a number of training symbols, which is a non-data part of the signal, equal to an anticipated delay spread to each of a beginning and an end of each of the first and the second symbol streams.

26. (Cancelled)

27. (Original) The system in claim 19 wherein the antennas within each group have polarizations different from one another.

28. (Currently Amended) A system for receiving and processing data comprising:

at least one antenna adapted to receive a first symbol stream in a first block of a frame and a second symbol stream in a second block of the frame, each symbol stream comprising a plurality of symbols;

a combining filter coupled to the antenna and adapted ~~to form a third symbol stream that is a time reversed~~for time reversing and taking the complex conjugate form of the second symbol stream received in the second block; and

a matched filter coupled to the combining filter and adapted to form decoupled first and second outputs from the first symbol stream and the time reversed and complex conjugate form of the second symbol stream~~third symbol streams~~.

29. (Original) The system of claim 28 further comprising an equalizer adapted to resolve intersymbol interference in the first and second blocks.

30. (Currently Amended) The system of claim 28 wherein the first and second symbol streams each comprises first and second portions, the first portion of the first symbol stream depending on a first ~~pre-transmission~~ symbol sequence $d_1(t)$ and a second portion of the first symbol stream depending on a second ~~pre-transmission~~ symbol sequence $d_2(t)$, the first portion of the second symbol stream depending on $d_2(t)$, the second portion of the second symbol stream depending on $d_1(t)$, and the matched filter forms the decoupled first and second outputs according to

$$\begin{bmatrix} z_1(t) \\ z_2(t) \end{bmatrix} = \begin{bmatrix} h_1^*(q) & h_2(q^{-1}) \\ h_2^*(q) & -h_1(q^{-1}) \end{bmatrix} \begin{bmatrix} r_1(t) \\ r_2(t) \end{bmatrix}$$

wherein $r_1(t)$ is the first symbol stream and $r_2(t)$ is the time reversed complex conjugate of the second symbol stream~~are the first and third symbol streams, respectively~~, $z_1(t)$ and $z_2(t)$ are the decoupled first and second outputs, respectively, $h_1(q^{-1})$ is a polynomial in a unit delay operator q^{-1}, describing a first channel from which the first portion of the first symbol stream is received, $h_2(q^{-1})$ is a polynomial in the unit delay operator q^{-1}, describing a second channel from which the second portion of the first symbol stream is received, $h_1^*(q)$ and $h_2^*(q)$ are polynomials in a unit advance operator q representing effective channels from which the first and second portions of the second symbol streams are received, respectively. outputs $z_1(t)$ and $z_2(t)$ are decoupled in that $z_1(t)$ depends on the first ~~pre-transmission~~ symbol stream $d_1(t)$ and not on the second ~~pre-transmission~~ symbol stream $d_2(t)$, and $z_2(t)$ depends on $d_2(t)$ and not on $d_1(t)$.

31. (Currently Amended) The system of claim 30 further comprising:

an estimator adapted to estimating the first ~~pre-transmission~~ symbol stream $d_1(t)$ and the second ~~pre-transmission~~ symbol stream $d_2(t)$ from the decoupled outputs $z_1(t)$ and $z_2(t)$, respectively.

32. (Previously Presented) The system of claim 28 wherein each of the first and second symbol streams is received by multiple antennas and is combined in order to increase signal quality and reduce interference.

33. (Previously Presented) The system of claim 28 further comprising an equalizer adapted to resolve intersymbol interference in the first and second blocks.

34. (Currently Amended) A method for receiving and processing signals transmitted from a transmitter to a receiver, the method comprising receiving a plurality of received symbol sequences each comprising symbols from a plurality of ~~pre-transmission~~ transmitter symbol streams, and processing the received symbol sequences to generate decoupled outputs each for separately detecting a different one of the ~~pre-transmission~~ transmitter symbol streams, wherein processing the received symbol sequences comprises time reversing at least one of the received symbol sequences after receiving it to generate at least one time reversed receiver symbol sequence.

35. (Previously Presented) The method of claim 34 wherein processing the received symbol sequences further comprises complex conjugating at least one of the symbol sequences, and filtering at least one symbol sequence in its received form and at least one symbol sequence in a time-reversed and complex conjugated form to generate the decoupled outputs.

36. (Previously Presented) The method of claim 34 wherein the plurality of symbol sequences are received from one or more channels and comprise known symbols, the method further comprising estimating the one or more channels using the known symbols.

37. (Currently Amended) ~~The method of claim 1~~A method of transmitting a signal having a sequence of symbols through at least one channel with intersymbol interference, comprising the steps of:

dividing the sequence of symbols to form a plurality of symbol streams, wherein dividing the sequence of symbols comprises assigning symbols in the sequence of symbols to a first symbol stream and a second symbol stream such that there is an equal amount of symbols in each of the first and second symbol streams and that correlation between symbols close to each other in each of the first and second symbol streams is not significantly effected; and

processing the plurality of symbol streams before transmitting each symbol stream through a channel, wherein processing the plurality of symbol streams comprises time-reversing

at least one of the symbol streams before transmitting the at least one of the processed symbol streams.

38. (Currently Amended) The method of claim 1 wherein processing the plurality of symbols streams further comprises complex conjugating at least one of the symbol streams before transmitting the at least one of the processed symbol streams.

39. (Previously Presented) The method of claim 12 wherein the first and second symbol streams comprise known symbols, the method further comprising estimating the first and the second channels using the known symbols.

40. (Previously Presented) The system of claim 30 wherein the first and second symbol streams comprise known symbols, the system further comprising a channel estimator adapted to estimate the first and the second channels using the known symbols.

41. (Currently Amended) An apparatus for receiving and processing signals transmitted from a transmitter, comprising:

means for receiving a plurality of symbol sequences, each symbol sequence comprising symbols from a plurality of ~~pre-transmission~~ symbol streams; and

means for processing the received symbol sequences to generate decoupled outputs each for separately detecting a different one of the ~~pre-transmission~~ symbol streams, wherein the means for processing the received symbol sequences comprises means for time reversing at least one of the symbol sequences.

42. (Previously Presented) The apparatus of claim 41 wherein the means for processing the received symbol sequences further comprises means for forming complex-conjugated forms of at least one of the symbol sequences.

43. (Currently Amended) The apparatus of claim 42 wherein the means for processing the received symbol sequences further comprises means for filtering at least one symbol sequence in its received form and at least one symbol sequence in a time-reversed and complex conjugated form to generate the decoupled outputs, each decoupled output depending on a different one of the ~~pre-transmission~~ symbol streams.